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## DEMANDE DE BREVET D'INVENTION

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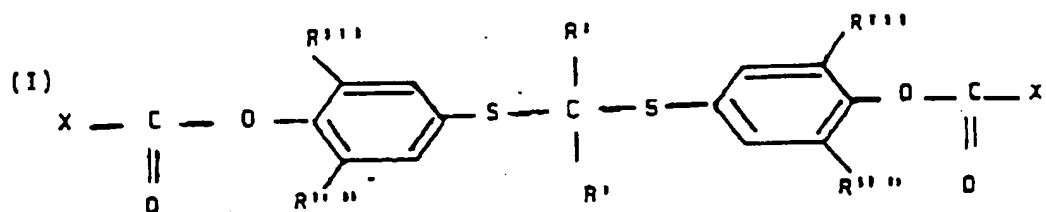
(54) Dérivés des bis (hydroxy-4 phénylthio) alcanes.

(72) Invention de :

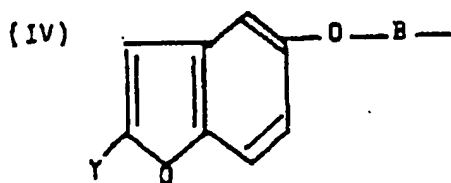
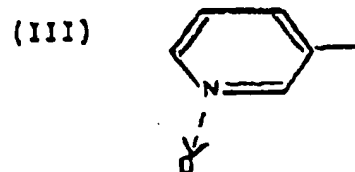
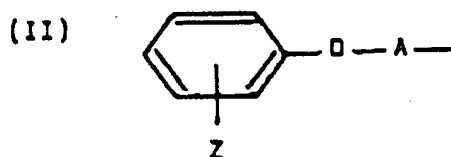
(33) (32) (31) Priorité conventionnelle :

The present invention relates to novel industrial products composed of esters derived from bis(4-hydroxyphenylthio)alkanes.

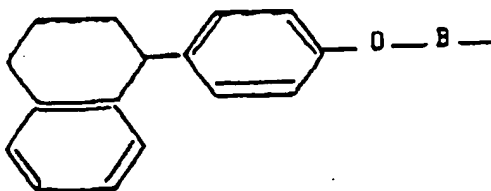
- 5 The compounds targeted by the invention are defined by the general formula I below:



- 10 In this formula, R' represents a light alkyl residue or a hydrogen atom;  
 R'' represents a methyl or ethyl residue;  
 R''' represents a tert-amyl or tert-butyl residue;  
 R''' represents a light alkyl residue;
- 15 X represents one of the residues defined by the following formulae:



(VI)



in which the N-oxide functional group is optional;

A represents a saturated or ethylenic divalent hydro-  
 5 carbonaceous group comprising 1 to 18 straight- or  
 branched-chain carbon atoms which can optionally carry  
 a ketone oxygen atom or a hydroxyl group or a phenyl,  
 alkylphenyl, aralkylphenyl, arylphenyl, acylphenyl,  
 alkoxyphenyl or halophenyl residue;

10 B represents a divalent hydrocarbonaceous group  
 comprising 1 to 5 carbon atoms in a straight or  
 branched and saturated or ethylenic chain;

Y represents a hydrogen atom or a light alkyl residue;

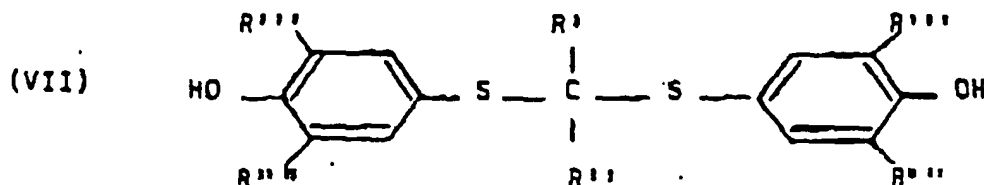
Z represents one to three optional substitutions which  
 15 can be one or more alkyl residues and/or one or more  
 alkenyl residues and/or one or more trifluoromethyl  
 residues and/or one or more cycloalkyl residues and/or  
 one or more cycloalkenyl residues and/or one or more  
 aryl residues and/or one or more aralkyl residues  
 20 and/or one or more aralkenyl residues and/or one or  
 more halogens and/or one or more alkoxy groups and/or  
 one or more alkylthio groups and/or one or more aryloxy  
 groups and/or one or more aralkoxy groups and/or one or  
 more arylthio groups and/or one or more aralkylthio  
 25 groups;

R can also represent a divalent hydrocarbonaceous group  
 -CH=CH-CH=CH- which joins two vicinal carbon atoms of  
 the benzene nucleus so as to form a naphthalene, which  
 can itself carry one or two substitutions listed above  
 5 and, when one of these substitutions is a cyclohexyl or  
 cyclohexenyl residue, the latter can carry a hydroxyl  
 or oxo functional group and/or an alkyl or alkenyl  
 residue.

10 The compounds of the invention have pharmacodynamic,  
 hypocholesterolemic and hypolipidemic properties.

The invention is also targeted at the processes for the  
 manufacture of the compounds defined by the above  
 15 general formula.

These processes consist of the action of the halide or  
 anhydride of an acid of general formula X-COOH on a  
 bis(4-hydroxyphenylthio)alkane of following general  
 20 formula VII



in which R', R'', R''' and R'''' are as were specified  
 25 previously.

The reaction is preferably carried out in an inert liquid which acts as solvent or vehicle, such as, for example, a hydrocarbon, an ether, an oxygenated heterocycle, an N,N-dialkylamide or their mixtures; the  
5 reaction is preferably carried out at a temperature greater than ambient temperature, such as, for example, that of the reflux of the solvent or vehicle used.

The reaction is preferably carried out in the presence  
10 of a base intended to fix the hydrohalic acid displaced in the reaction, it being possible for said base to be, for example, an alkaline hydroxide or carbonate, a tertiary amine or a tertiary nitrogenous heterocycle, it being possible for the latter to act partially or  
15 completely as solvent for the reactants present. Use may also be made of an O-metallic derivative, isolated beforehand, of the bis(4-hydroxyphenylthio)alkane.

#### Example 1

20 2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylpropionyloxy]-3,5-di(tert-butyl)phenylthio]propane

268 grams (0.5 mol) of 2,2-bis(3,5-di(tert-butyl)-4-hydroxyphenylthio)propane and 101 grams (1 mol) of  
25 triethylamine are introduced into 4 liters of dry benzene; 216 grams (1 mol) of 2-(4-chlorophenoxy)-2-methylpropionyl chloride are slowly added; the mixture is stirred for 30 minutes and gradually brought to

reflux, which reflux is maintained for 30 minutes; the mixture is filtered, without cooling, to remove the triethylamine hydrochloride and then the benzene is evaporated under reduced pressure; the residue is washed with a small amount of pentane and dried under vacuum.

Example 2

10 By replacing 2,2-bis[3,5-di(tert-butyl)-4-hydroxyphenylthio]propane with an equimolecular amount of another bis(4-hydroxyphenylthio)alkane in accordance with the formula III in the reaction of Example 1, it is possible in particular to obtain the following  
15 compounds:

1,1-Bis[4-[2-(4-chlorophenoxy)-2-methylpropionyloxy]-3,5-di(tert-butyl)phenylthio]propane

1,1-Bis[4-[2-(4-chlorophenoxy)-2-methylpropionyloxy]-3,5-di(tert-butyl)phenylthio]ethane

20 2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylpropionyloxy]-3,5-di(tert-butyl)phenylthio]butane

2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylpropionyloxy]-3,5-di(tert-butyl)phenylthio]hexane

2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylpropionyloxy]-3,5-di(tert-amyl)phenylthio]propane  
25

2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylpropionyloxy]-3-methyl-5-(tert-butyl)phenylthio]propane

- 2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylpropionyloxy]-3-isopropyl-5-(tert-butyl)phenylthio]propane
- 1,1-Bis[4-[2-(4-chlorophenoxy)-2-methylpropionyloxy]-3-isopropyl-5-(tert-butyl)phenylthio]ethane
- 5 2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylpropionyloxy]-3-isopropyl-5-(tert-butyl)phenylthio]pentane

Example 3

- 10 By replacing 2-(4-chlorophenoxy)-2-methylpropionyl chloride in the reaction of Example 1 with an equimolecular amount of another chloride X-CO-Cl in accordance with the formula II, it is possible in particular to obtain the following compounds:
- 15 2,2-Bis[4-[2-(4-chlorophenoxy)acetoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[(4-chlorophenoxy)propionyloxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylpropionyloxy]-3,5-
- 20 di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-methyl-2-(4-(trifluoromethyl)phenoxy)-propionyloxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-(2,4-dichlorophenoxy)-2-methylpropionyloxy]-3,5-di(tert-butyl)phenylthio]propane
- 25 2,2-Bis[4-[2-(4-methylphenoxy)-2-methylpropionyloxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-(4-chlorophenoxy)butyryloxy]-3,5-di(tert-butyl)phenylthio]propane



- 2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylbutyroxyl]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-(4-(trifluoromethyl)phenoxy)butyroxyl]-3,5-di(tert-butyl)phenylthio]propane
- 5 2,2-Bis[4-[2-methyl-2-(4-(trifluoromethyl)phenoxy)-butyroxyl]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-methyl-4-phenoxyvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-ethyl-4-phenoxyvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 10 2,2-Bis[4-[2,4-dimethyl-4-phenoxyvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2,4-dimethyl-4-phenoxy-2-pentenoyloxy]-3,5-di(tert-butyl)phenylthio]propane
- 15 2,2-Bis[4-[4-(4-chlorophenoxy)-4-methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-(4-chlorophenoxy)-2,4-dimethylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 20 2,2-Bis[4-[4-(4-chlorophenoxy)-2,4-dimethyl-2-pentenoyloxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-(4-chloro-2-methylphenoxy)-2,4-dimethylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-(4-chlorophenoxy)butyroxyl]-3,5-di(tert-butyl)phenylthio]propane
- 25 2,2-Bis[4-[4-(4-chlorophenoxy)-3-hydroxy-4-methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

- 2,2-Bis[4-[4-(4-chlorophenoxy)-3-oxo-4-methylvalerian-  
oxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-(4-chlorophenoxy)-3-hydroxy-2,4-dimethyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 5 2,2-Bis[4-[4-(4-chlorophenoxy)-3-oxo-2,4-dimethyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-(4-chlorophenoxy)-3-hydroxy-2-methyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-(2,4-dichlorophenoxy)-3-hydroxy-4-methyl-  
10 valerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-(2,4-dichlorophenoxy)-3-oxo-4-methyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-(2,4-dichlorophenoxy)-3-hydroxy-2-methyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 15 2,2-Bis[4-[4-(2,4-dichlorophenoxy)-3-oxo-2-methyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-(2,4-dichlorophenoxy)-3-hydroxy-2,4-di-  
methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-(2,4-dichlorophenoxy)-3-oxo-2,4-dimethyl-  
20 valerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-(4-(trifluoromethyl)phenoxy)-3-hydroxy-4-  
methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-(4-(trifluoromethyl)phenoxy)-3-hydroxy-2-  
methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 25 2,2-Bis[4-[4-(4-(trifluoromethyl)phenoxy)-3-oxo-4-  
methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-(4-(trifluoromethyl)phenoxy)-3-oxo-2-  
methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

- 2,2-Bis[4-[4-(2,4-dimethylphenoxy)-3-hydroxy-4-methyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-(2,4-dimethylphenoxy)-3-oxo-4-methyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 5 2,2-Bis[4-[4-(2,4-dimethylphenoxy)-3-hydroxy-2-methyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-(2,4-dimethylphenoxy)-3-oxo-2-methyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-(2-methyl-4-chlorophenoxy)-3-hydroxy-4-  
10 methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-(2-methyl-4-chlorophenoxy)-3-hydroxy-2-  
methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-(2-methyl-4-chlorophenoxy)-3-oxo-4-methyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 15 2,2-Bis[4-[4-(2-methyl-4-chlorophenoxy)-3-oxo-2-methyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[ $\alpha$ -(2-methyl-4-chlorophenoxy)- $\alpha$ -(4-chloro-  
phenyl)acetoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[ $\alpha$ -(2-methyl-4-chlorophenoxy)- $\alpha$ -(4-(tri-  
20 fluoromethyl)phenyl)acetoxy]-3,5-di(tert-butyl)phenyl-  
thio]propane
- 2,2-Bis[4-[ $\alpha$ -(2,4-dichlorophenoxy)- $\alpha$ -(4-chlorophenyl)-  
acetoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[ $\alpha$ -(2,4-dimethylphenoxy)- $\alpha$ -(4-chlorophenyl)-  
25 acetoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[ $\alpha$ -(4-chlorophenoxy)- $\alpha$ -(4-chlorophenyl)-  
acetoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[ $\alpha$ -(2,4-dimethylphenoxy)- $\alpha$ -(4-chlorophenyl)-  
acetoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[ $\alpha$ -(4-(trifluoromethyl)phenoxy)- $\alpha$ -(4-chloro-  
phenyl)acetoxy]-3,5-di(tert-butyl)phenylthio]propane

5 2,2-Bis[4-[ $\alpha$ -(2-methyl-4-(trifluoromethyl)phenoxy)- $\alpha$ -  
(4-chlorophenyl)acetoxy]-3,5-di(tert-butyl)phenylthio]-  
propane

2,2-Bis[4-[2-(6-cyclohexyl-2-naphthyl)oxy-2-methyl-  
propionoxy]-3,5-di(tert-butyl)phenylthio]propane

10 2,2-Bis[2-[6-(3-hydroxycyclohexyl)-2-naphthyl]oxy-2-  
methylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-[6-(3-hydroxy-3-methylcyclohexyl)-2-  
naphthyl]oxy-2-methylpropionoxy]-3,5-di(tert-butyl)-  
phenylthio]propane

15 2,2-Bis[4-[2-[6-(3-hydroxy-1-cyclohexenyl)-2-  
naphthyl]oxy-2-methylpropionoxy]-3,5-di(tert-  
butyl)phenylthio]propane

2,2-Bis[4-[2-[6-(3-hydroxy-3-ethylcyclohexyl)-2-  
naphthyl]oxy-2-methylpropionoxy]-3,5-di(tert-butyl)-

20 phenylthio]propane

2,2-Bis[4-[2-[6-(3-hydroxy-3-vinylcyclohexyl)-2-  
naphthyl]oxy-2-methylpropionoxy]-3,5-di(tert-butyl)-  
phenylthio]propane

2,2-Bis[4-(6-cyclohexyl-2-naphthyl)oxyacetoxy]-3,5-  
25 di(tert-butyl)phenylthio]propane

2,2-Bis[4-[[6-(3-oxocyclohexyl)-2-naphthyl]oxyacetoxy]-  
3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-[6-(3-oxocyclohexyl)-2-naphthyl]oxy-2-methylpropionyloxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[[6-(3-oxo-1-cyclohexenyl)-2-naphthyl]oxy-acetoxy]-3,5-di(tert-butyl)phenylthio]propane

5 2,2-Bis[4-[2-[6-(3-oxo-1-cyclohexenyl)-2-naphthyl]oxy-2-methylpropionyloxy]-3,5-di(tert-butyl)phenylthio]propane

#### Example 4

10 2,2-Bis(4-nicotinoyloxy-3,5-di(tert-butyl)phenylthio)propane

268 grams (0.5 mol) of 2,2-bis(3,5-di(tert-butyl)-4-hydroxyphenylthio)propane and 101 grams (1 mol) of  
15 triethylamine are introduced into 4 liters of dry benzene; 142 grams (1 mol) of nicotinoyl chloride are gradually added; the mixture is stirred for 30 minutes and then gradually brought to reflux, which reflux is maintained for 30 minutes; the mixture is filtered,  
20 without cooling, to remove the triethylamine hydrochloride and then the benzene is evaporated under reduced pressure; the residue is washed with a small amount of pentane and dried under vacuum.

25

#### Example 5

By replacing 2,2-bis(3,5-di(tert-butyl)-4-hydroxyphenylthio)propane with an equimolecular amount of

another bis(4-hydroxyphenylthio)alkane in accordance with the formula VIII in the reaction of Example 4, it is possible in particular to obtain the following compounds:

- 5 1,1-Bis(4-nicotinoyloxy-3,5-di(tert-butyl)phenylthio)-  
propane  
1,1-Bis(4-nicotinoyloxy-3,5-di(tert-butyl)phenylthio)-  
ethane  
2,2-Bis(4-nicotinoyloxy-3,5-di(tert-butyl)phenylthio)-  
10 butane  
2,2-Bis(4-nicotinoyloxy-3,5-di(tert-butyl)phenylthio)-  
hexane  
2,2-Bis(4-nicotinoyloxy-3,5-di(tert-amyl)phenylthio)-  
propane  
15 2,2-Bis(4-nicotinoyloxy-3-methyl-5-(tert-butyl)phenyl-  
thio)propane  
2,2-Bis(4-nicotinoyloxy-3-isopropyl-5-(tert-butyl)-  
phenylthio)propane  
1,1-Bis(4-nicotinoyloxy-3-isopropyl-5-(tert-butyl)-  
20 phenylthio)ethane  
2,2-Bis(4-nicotinoyloxy-3-isopropyl-5-(tert-butyl)-  
phenylthio)pentane

#### Example 6

25

By replacing nicotinoyl chloride with an equimolecular amount of an N-oxide of nicotinoyl chloride in

Examples 4 and 5, it is possible in particular to obtain the following compounds:

- 2,2-Bis(4-(N-oxynicotinoyloxy)-3,5-di(tert-butyl)phenylthio)propane
- 5 1,1-Bis(4-(N-oxynicotinoyloxy)-3,5-di(tert-butyl)phenylthio)propane
- 1,1-Bis(4-(N-oxynicotinoyloxy)-3,5-di(tert-butyl)phenylthio)ethane
- 2,2-Bis(4-(N-oxynicotinoyloxy)-3,5-di(tert-
- 10 butyl)phenylthio)butane
- 2,2-Bis(4-(N-oxynicotinoyloxy)-3,5-di(tert-butyl)phenylthio)hexane
- 2,2-Bis(4-(N-oxynicotinoyloxy)-3,5-di(tert-amyl)phenylthio)propane
- 15 2,2-Bis(4-(N-oxynicotinoyloxy)-3-methyl-5-(tert-butyl)-phenylthio)propane
- 2,2-Bis(4-(N-oxynicotinoyloxy)-3-isopropyl-5-(tert-butyl)phenylthio)propane
- 1,1-Bis(4-(N-oxynicotinoyloxy)-3-isopropyl-5-(tert-
- 20 butyl)phenylthio)ethane
- 2,2-Bis(4-(N-oxynicotinoyloxy)-3-isopropyl-5-(tert-butyl)phenylthio)pentane

Example 7

- 25 2,2-Bis[4-(5-thiazolylcarbonyloxy)-3,5-di(tert-butyl)phenylthio]propane

268 grams (0.5 mol) of 2,2-bis(3,5-di(tert-butyl)-4-hydroxyphenylthio)propane and 101 grams (1 mol) of triethylamine are introduced into 4 liters of dry benzene; 148 grams (1 mol) of 5-thiazolecarbonyl chloride are gradually added; the mixture is stirred for 30 minutes and then gradually brought to reflux, which reflux is maintained for 30 minutes; the mixture is filtered, without cooling, in order to remove the triethylamine hydrochloride and then the benzene is evaporated under reduced pressure; the residue is washed with a small amount of pentane and dried under vacuum.

#### Example 8

15

By replacing 2,2-bis(3,5-di(tertbutyl)-4-hydroxyphenylthio)propane with an equimolecular amount of another bis(4-hydroxyphenylthio)alkane in accordance with the formula VII in the reaction of Example 7, it is possible in particular to obtain the following compounds:

20

1,1-Bis[4-(5-thiazolylcarbonyloxy)-3,5-di(tert-butyl)-phenylthio]propane

25

1,1-Bis[4-(5-thiazolylcarbonyloxy)-3,5-di(tert-butyl)-phenylthio]ethane

2,2-Bis[4-(5-thiazolylcarbonyloxy)-3,5-di(tert-butyl)-phenylthio]butane



2,2-Bis[4-(5-thiazolylcarbonyloxy)-3,5-di(tert-butyl)-phenylthio]hexane

2,2-Bis[4-(5-thiazolylcarbonyloxy)-3,5-di(tert-amyl)-phenylthio]propane

5 2,2-Bis[4-(5-thiazolylcarbonyloxy)-3-methyl-5-(tert-butyl)phenylthio]propane

2,2-Bis[4-(5-thiazolylcarbonyloxy)-3-isopropyl-5-(tert-butyl)phenylthio]propane

10 1,1-Bis[4-(5-thiazolylcarbonyloxy)-3-isopropyl-5-(tert-butyl)phenylthio]ethane

2,2-Bis[4-(5-thiazolylcarbonyloxy)-3-isopropyl-5-(tert-butyl)phenylthio]pentane

#### Example 9

15 2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methylpropionyloxy]-3,5-di(tert-butyl)phenylthio]propane

268 grams (0.5 mol) of 2,2-bis(3,5-di(tert-butyl)-4-hydroxyphenylthio)propane and 101 grams (1 mol) of dry  
20 ethylamine are introduced into 4 liters of dry benzene;  
253 grams (1 mol) of 2-(2-methyl-5-benzofuryl)oxy-2-methylpropionyl chloride are gradually added; the mixture is stirred for 30 minutes and then gradually brought to reflux, which reflux is maintained for 30  
25 minutes; the mixture is filtered, without cooling, in order to remove the triethylamine hydrochloride and then the benzene is evaporated under reduced pressure;

the residue is washed with a small amount of pentane and dried under vacuum.

Example 10

5

By replacing 2,2-bis(3,5-di(tert-butyl)-4-hydroxyphenylthio)propane with an equimolecular amount of another bis(4-hydroxyphenylthio)alkane in accordance with the formula VII in the reaction of Example 9, it is possible in particular to obtain the following compounds:

- 1,1-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methylpropionyloxy]-3,5-di(tert-butyl)phenylthio]propane
- 1,1-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methylpropionyloxy]-3,5-di(tert-butyl)phenylthio]ethane
- 2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methylpropionyloxy]-3,5-di(tert-butyl)phenylthio]butane
- 2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methylpropionyloxy]-3,5-di(tert-butyl)phenylthio]hexane
- 2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methylpropionyloxy]-3,5-di(tert-amyl)phenylthio]propane
- 2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methylpropionyloxy]-3-methyl-5-(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methylpropionyloxy]-3-isopropyl-5-(tert-butyl)phenylthio]propane
- 1,1-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methylpropionyloxy]-3-isopropyl-5-(tert-butyl)phenylthio]ethane

2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methyl-  
propionoxy]-3-isopropyl-5-(tert-butyl)phenylthio]-  
pentane

5

Example 11

By replacing 2-(2-methyl-5-benzofuryl)oxy-2-methylpropionyl chloride in the reaction of Example 9 with an equimolecular amount of another chloride  
10 X-CO-Cl in accordance with the formula II, it is possible in particular to obtain the following compounds:

2,2-Bis[4-[2-(5-benzofuryl)oxyacetoxy]-3,5-di(tert-butyl)phenylthio]propane

15 2,2-Bis[4-[2-(5-benzofuryl)oxypropionoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-(5-benzofuryl)oxy-2-methylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane

20 2,2-Bis[4-[2-(5-benzofuryl)oxy-2-ethylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-(5-benzofuryl)oxy-2-ethylbutyroxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-(5-benzofuryl)oxy-2-methylbutyroxy]-3,5-di(tert-butyl)phenylthio]propane

25 2,2-Bis[4-[2-(5-benzofuryl)oxybutyroxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[4-(5-benzofuryl)oxybutyroxy]-3,5-di(tert-butyl)phenylthio]propane

- 2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-ethyl-  
propionoxy]-3,5-di(tert-butyl)phenylthio]propane  
2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-ethyl-  
butyroxyl]-3,5-di(tert-butyl)phenylthio]propane  
5 2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxyacetoxyl]-3,5-  
di(tert-butyl)phenylthio]propane  
2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxypropionoxyl]-3,5-  
di(tert-butyl)phenylthio]propane  
2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxybutyroxyl]-3,5-  
10 di(tert-butyl)phenylthio]propane  
2,2-Bis[4-[4-(2-methyl-5-benzofuryl)oxybutyroxyl]-3,5-  
di(tert-butyl)phenylthio]propane  
2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxyvalerianoxyl]-  
3,5-di(tert-butyl)phenylthio]propane  
15 2,2-Bis[4-[3-(2-methyl-5-benzofuryl)oxypropionoxyl]-3,5-  
di(tert-butyl)phenylthio]propane  
2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxyacryloyloxy]-  
3,5-di(tert-butyl)phenylthio]propane  
2,2-Bis[4-[2-(2-ethyl-5-benzofuryl)oxy-2-methyl-  
20 propionoxyl]-3,5-di(tert-butyl)phenylthio]propane  
2,2-Bis[4-[2-(2-isopropyl-5-benzofuryl)oxyacetoxyl]-3,5-  
di(tert-butyl)phenylthio]propane  
2,2-Bis[4-[2-(2-isopropyl-5-benzofuryl)oxy-2-methyl-  
propionoxyl]-3,5-di(tert-butyl)phenylthio]propane  
25

Example 12

2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-  
methylpropionoxyl]-3,5-di(tert-butyl)phenylthio]propane

268 grams (0.5 mol) of 2,2-bis(3,5-di(tert-butyl)-4-hydroxyphenylthio)propane and 54 grams (1 mol) of sodium methoxide are introduced into 5 liters of dry benzene; one liter of benzene is distilled off in order to remove the displaced methanol and then 253 grams (1 mol) of 2-[4-(1-tetralinyl)phenoxy]-2-methylpropionyl chloride are gradually added; the mixture is stirred for 30 minutes and then gradually brought to reflux, which reflux is maintained for 30 minutes; the mixture is filtered, without cooling, in order to remove the sodium chloride and then the benzene is evaporated under reduced pressure; the residue is washed with a small amount of pentane and dried under vacuum.

Example 13

By replacing 2,2-bis(3,5-di(tert-butyl)-4-hydroxyphenylthio)propane with an equimolecular amount  
5 of another bis(4-hydroxyphenylthio)alkane in accordance with the formula VII in the reaction of Example 12, it is possible in particular to obtain the following compounds:

- 1,1-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methylpro-  
10 pionoxy]-3,5-di(tert-butyl)phenylthio]propane  
1,1-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methylpro-  
pionoxy]-3,5-di(tert-butyl)phenylthio]ethane  
2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methylpro-  
pionoxy]-3,5-di(tert-butyl)phenylthio]butane  
15 2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methylpro-  
pionoxy]-3,5-di(tert-butyl)phenylthio]hexane  
2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methylpro-  
pionoxy]-3,5-di(tert-amyl)phenylthio]propane  
2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methylpro-  
20 pionoxy]-3-methyl-5-(tert-butyl)phenylthio]propane  
2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methylpro-  
pionoxy]-3-isopropyl-5-(tert-butyl)phenylthio]propane  
1,1-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methylpro-  
pionoxy]-3-isopropyl-5-(tert-butyl)phenylthio]ethane  
25 2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methylpro-  
pionoxy]-3-isopropyl-5-(tert-butyl)phenylthio]pentane

Example 14

By replacing, in the reactions of Example 12, 2-[4-(1-tetralinyl)phenoxy]-2-methylpropionyl chloride with an  
5 equimolecular amount of another acid chloride X-CO-Cl derived from the formula VI, it is possible in particular to obtain the following compounds:

2,2-Bis[4-[4-(1-tetralinyl)phenoxy]acetoxy]-3,5-di(tert-butyl)phenylthio]propane

10 2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]propionoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane

15 2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-ethylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-ethylbutyroxyl]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]butyroxyl]-3,5-di(tert-butyl)phenylthio]propane

20 2,2-Bis[4-[5-[4-(1-tetralinyl)phenoxy]valerianoxy]-3,5-di(tert-butyl)phenylthio]propane

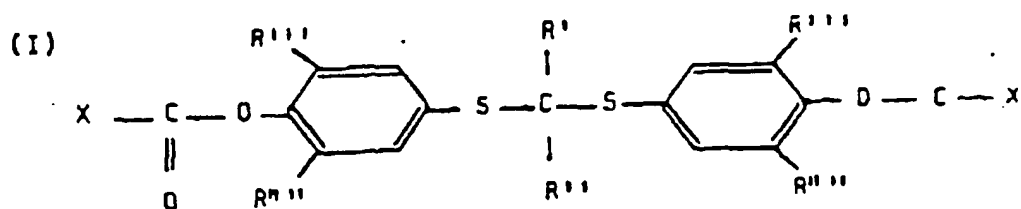
2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]valerianoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]acryloyloxy]-3,5-  
25 di(tert-butyl)phenylthio]propane

CLAIMS

1. Industrial products composed of the compounds defined by the following general formula I:

5



in which

R' represents a light alkyl residue or a hydrogen atom;

10

R'' represents a methyl or ethyl residue;

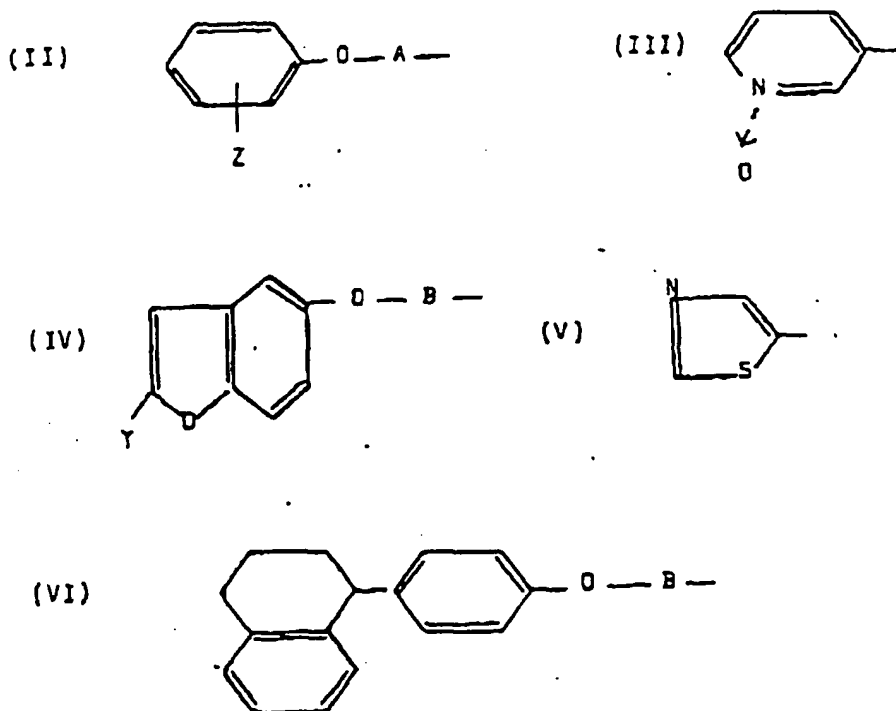
R''' represents a tert-amyl or tert-butyl residue;

R'''' represents a light alkyl residue;

X represents one of the residues defined by the following formulae:

15





in which the N-oxide functional group is optional;  
A represents a saturated or ethylenic divalent  
hydrocarbonaceous group comprising 1 to 18  
5 straight- or branched-chain carbon atoms which can  
optionally carry a ketone oxygen atom or a  
hydroxyl group or a phenyl, alkylphenyl,  
aralkylphenyl, arylphenyl, acylphenyl,  
alkoxyphenyl or halophenyl residue;

10 B represents a divalent hydrocarbonaceous group  
comprising 1 to 5 carbon atoms in a straight or  
branched and saturated or ethylenic chain;

Y represents a hydrogen atom or a light alkyl  
residue;

15 Z represents one to three optional substitutions  
which can be one or more alkyl residues and/or one  
or more alkenyl residues and/or one or more

trifluoromethyl residues and/or one or more  
cycloalkyl residues and/or one or more  
cycloalkenyl residues and/or one or more aryl  
residues and/or one or more aralkyl residues  
5 and/or one or more aralkenyl residues and/or one  
or more halogens and/or one or more alkoxy groups  
and/or one or more alkylthio groups and/or one or  
more aryloxy groups and/or one or more aralkoxy  
groups and/or one or more arylthio groups and/or  
10 one or more aralkylthio groups;

R can also represent a divalent hydrocarbonaceous  
group  $\text{-CH=CH-CH=CH-}$  which joins two vicinal carbon  
atoms of the benzene nucleus so as to form a  
naphthalene, which itself can carry one or two  
15 substitutions listed above and, when one of these  
substitutions is a cyclohexyl or cyclohexenyl  
residue, the latter can carry a hydroxyl or oxo  
functional group and/or an alkyl or alkenyl  
residue.

20

2. Industrial product in accordance with the first  
claim, composed of 2,2-bis[4-[2-(4-chloro-  
phenyl)propionoxy]-3,5-di(tert-butyl)phenylthio]-  
propane.

25

3. Industrial products in accordance with the first  
claim composed of the following compounds:

- 1,1-Bis[4-[2-(4-chlorophenoxy)-2-methylpropion-  
oxy]-3,5-di(tert-butyl)phenylthio]propane  
1,1-Bis[4-[2-(4-chlorophenoxy)-2-methylpropion-  
oxy]-3,5-di(tert-butyl)phenylthio]ethane  
5 2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylpropion-  
oxy]-3,5-di(tert-butyl)phenylthio]butane  
2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylpropion-  
oxy]-3,5-di(tert-butyl)phenylthio]hexane  
2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylpropion-  
oxy]-3,5-di(tert-amyl)phenylthio]propane  
10 2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylpropion-  
oxy]-3-methyl-5-(tert-butyl)phenylthio]propane  
2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylpropion-  
oxy]-3-isopropyl-5-(tert-butyl)phenylthio]propane  
15 1,1-Bis[4-[2-(4-chlorophenoxy)-2-methylpropion-  
oxy]-3-isopropyl-5-(tert-butyl)phenylthio]ethane  
2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylpropion-  
oxy]-3-isopropyl-5-(tert-butyl)phenylthio]pentane.
- 20 4. Products in accordance with the first claim  
composed of the following compounds:  
2,2-Bis[4-[(4-chlorophenoxy) acetoxy]-3,5-di(tert-  
butyl)phenylthio]propane  
2,2-Bis[4-[2-(4-chlorophenoxy) propionoxy]-3,5-di-  
25 (tert-butyl)phenylthio]propane  
2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylpropion-  
oxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-methyl-2-(4-(trifluoromethyl)-  
phenoxy)propionyloxy]-3,5-di(tert-butyl)phenylthio]-  
propane

5 2,2-Bis[4-[2-(2,4-dichlorophenoxy)-2-methylpro-  
pionyloxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-(4-methylphenoxy)-2-  
methylpropionyloxy]-3,5-di(tert-  
butyl)phenylthio]propane

10 2,2-Bis[4-[2-(4-chlorophenoxy)butyryloxy]-3,5-di-  
(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-(4-chlorophenoxy)-2-methylbutyryloxy]-  
3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-(4-(trifluoromethyl)phenoxy)-  
butyryloxy]-3,5-di(tert-butyl)phenylthio]propane

15 2,2-Bis[4-[2-methyl-2-(4-(trifluoromethyl)-  
phenoxy)butyryloxy]-3,5-di(tert-butyl)phenylthio]-  
propane

2,2-Bis[4-[4-methyl-4-phenoxyvalerianoyloxy]-3,5-di-  
(tert-butyl)phenylthio]propane

20 2,2-Bis[4-[4-ethyl-4-phenoxyvalerianoyloxy]-3,5-di-  
(tert-butyl)phenylthio]propane

2,2-Bis[4-[2,4-dimethyl-4-phenoxyvalerianoyloxy]-3,5-  
di(tert-butyl)phenylthio]propane

25 2,2-Bis[4-[2,4-dimethyl-4-phenoxy-2-pentenoyloxy]-  
3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[4-(4-chlorophenoxy)-4-methylvalerian-  
oyloxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[4-(4-chlorophenoxy)-2,4-dimethyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane  
2,2-Bis[4-[4-(4-chlorophenoxy)-2,4-dimethyl-2-  
pentenoyloxy]-3,5-di(tert-butyl)phenylthio]propane  
5 2,2-Bis[4-[4-(4-chloro-2-methylphenoxy)-2,4-di-  
methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]-  
propane  
2,2-Bis[4-[4-(4-chlorophenoxy)butyroy]-3,5-di-  
(tert-butyl)phenylthio]propane.

10

5. Products in accordance with the first claim  
composed of the following compounds:

2,2-Bis[4-[4-(4-chlorophenoxy)-3-hydroxy-4-methyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane

15

2,2-Bis[4-[4-(4-chlorophenoxy)-3-oxo-4-methyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[4-(4-chlorophenoxy)-3-hydroxy-2,4-di-  
methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]-  
propane

20

2,2-Bis[4-[4-(4-chlorophenoxy)-3-oxo-2,4-dimethyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[4-(4-chlorophenoxy)-3-hydroxy-2-methyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane

25

2,2-Bis[4-[4-(2,4-dichlorophenoxy)-3-hydroxy-4-  
methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]-  
propane

2,2-Bis[4-[4-(2,4-dichlorophenoxy)-3-oxo-4-methyl-  
valerianoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[4-(2,4-dichlorophenoxy)-3-hydroxy-2-methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

5 2,2-Bis[4-[4-(2,4-dichlorophenoxy)-3-oxo-2-methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[4-(2,4-dichlorophenoxy)-3-hydroxy-2,4-dimethylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

10 2,2-Bis[4-[4-(2,4-dichlorophenoxy)-3-oxo-2,4-dimethylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[4-(4-(trifluoromethyl)phenoxy)-3-hydroxy-4-methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

15 2,2-Bis[4-[4-(4-(trifluoromethyl)phenoxy)-3-hydroxy-2-methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

20 2,2-Bis[4-[4-(4-(trifluoromethyl)phenoxy)-3-oxo-4-methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[4-(4-(trifluoromethyl)phenoxy)-3-oxo-2-methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

25 2,2-Bis[4-[4-(2,4-dimethylphenoxy)-3-hydroxy-4-methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[4-(2,4-dimethylphenoxy)-3-oxo-4-methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[4-(2,4-dimethylphenoxy)-3-hydroxy-2-methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

5 2,2-Bis[4-[4-(2,4-dimethylphenoxy)-3-oxo-2-methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-(2-methyl-4-chlorophenoxy)-3-hydroxy-4-methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

10 2,2-Bis[4-[2-(2-methyl-4-chlorophenoxy)-3-hydroxy-2-methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-(2-methyl-4-chlorophenoxy)-3-oxo-4-methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

15 2,2-Bis[4-[4-(2-methyl-4-chlorophenoxy)-3-oxo-2-methylvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane.

20 6. Products in accordance with the first claim composed of the following compounds:

2,2-Bis[4-[ $\alpha$ -(2-methyl-4-chlorophenoxy)- $\alpha$ -(4-chlorophenyl)acetoxy]-3,5-di(tert-butyl)phenylthio]propane

25 2,2-Bis[4-[ $\alpha$ -(2-methyl-4-chlorophenoxy)- $\alpha$ -(4-(trifluoromethyl)phenyl)acetoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[ $\alpha$ -(2,4-dichlorophenoxy)- $\alpha$ -(4-chloro-phenyl)acetoxy]-3,5-di(tert-butyl)phenylthio]-propane

5 2,2-Bis[4-[ $\alpha$ -(2,4-dimethylphenoxy)- $\alpha$ -(4-chloro-phenyl)acetoxy]-3,5-di(tert-butyl)phenylthio]-propane

2,2-Bis[4-[ $\alpha$ -(4-chlorophenoxy)- $\alpha$ -(4-chlorophenyl)-acetoxy]-3,5-di(tert-butyl)phenylthio]propane

10 2,2-Bis[4-[ $\alpha$ -(2,4-dimethylphenoxy)- $\alpha$ -(4-chloro-phenyl)acetoxy]-3,5-di(tert-butyl)phenylthio]-propane

2,2-Bis[4-[ $\alpha$ -(4-(trifluoromethyl)phenoxy)- $\alpha$ -(4-chlorophenyl)acetoxy]-3,5-di(tert-butyl)phenylthio]propane

15 2,2-Bis[4-[ $\alpha$ -(2-methyl-4-(trifluoromethyl)-phenoxy)- $\alpha$ -(4-chlorophenyl)acetoxy]-3,5-di(tert-butyl)phenylthio]propane.

7. Products in accordance with the first claim  
20 composed of the following compounds:

2,2-Bis[4-[2-(6-cyclohexyl-2-naphthyl)oxy-2-methylpropionoxy]-3,5-di(tert-butyl)phenylthio]-propane

25 2,2-Bis[4-[2-[6-(3-hydroxycyclohexyl)-2-naphthyl]oxy-2-methylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane



2,2-Bis[4-[2-[6-(3-hydroxy-3-methylcyclohexyl)-2-naphthyl]oxy-2-methylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane

5 2,2-Bis[4-[2-[6-(3-hydroxy-1-cyclohexenyl)-2-naphthyl]oxy-2-methylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-[6-(3-hydroxy-3-ethylcyclohexyl)-2-naphthyl]oxy-2-methylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane

10 2,2-Bis[4[2-[6-(3-hydroxy-3-vinylcyclohexyl)-2-naphthyl]oxy-2-methylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[(6-cyclohexyl-2-naphthyl)oxyacetoxyl]-3,5-di(tert-butyl)phenylthio]propane

15 2,2-Bis[4-[[6-(3-oxocyclohexyl)-2-naphthyl]oxyacetoxyl]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-[6-(3-oxocyclohexyl)-2-naphthyl]oxy-2-methylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane

20 2,2-Bis[4-[[6-(3-oxo-1-cyclohexenyl)-2-naphthyl]oxyacetoxyl]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-[6-(3-oxo-1-cyclohexenyl)-2-naphthyl]oxy-2-methylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane.

25

8. Industrial product in accordance with the first claim composed of 2,2-bis[4-[2-[4-(1-tetra-

linyl)phenoxy]-2-methylpropiony]-3,5-di(tert-butyl)phenylthio]propane.

9. Products in accordance with the first claim  
5 composed of the following compounds:

1,1-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methyl-  
propiony]-3,5-di(tert-butyl)phenylthio]propane

1,1-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methyl-  
propiony]-3,5-di(tert-butyl)phenylthio]ethane

10 2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methyl-  
propiony]-3,5-di(tert-butyl)phenylthio]butane

2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methyl-  
propiony]-3,5-di(tert-butyl)phenylthio]hexane

15 2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methyl-  
propiony]-3,5-di(tert-amyl)phenylthio]propane

2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methyl-  
propiony]-3-methyl-5-(tert-butyl)phenylthio]-  
propane

20 2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methyl-  
propiony]-3-isopropyl-5-(tert-butyl)phenyl-  
thio]propane

1,1-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methyl-  
propiony]-3-isopropyl-5-(tert-butyl)phenylthio]-  
ethane

25 2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methyl-  
propiony]-3-isopropyl-5-(tert-butyl)phenyl-  
thio]pentane.

10. Products in accordance with the first claim composed of the following compounds:

2,2-Bis[4-[4-(1-tetralinyl)phenoxyacetoxy]-3,5-di-(tert-butyl)phenylthio]propane

5 2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]propionoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-methylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane

10 2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-ethylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]-2-ethylbutyroxyl]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]butyroxyl]-3,5-di(tert-butyl)phenylthio]propane

15 2,2-Bis[4-[5-[4-(1-tetralinyl)phenoxy]valerianoxy]-3,5-di(tert-butyl)phenylthio]propane

2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]valerianoxy]-3,5-di(tert-butyl)phenylthio]propane

20 2,2-Bis[4-[2-[4-(1-tetralinyl)phenoxy]acryloyloxy]-3,5-di(tert-butyl)phenylthio]propane.

11. Industrial product in accordance with the first claim composed of 2,2-bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane.

25

12. Industrial products in accordance with the first claim composed of the following compounds:

- 1,1-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methyl-propionoxy]-3,5-di(tert-butyl)phenylthio]propane  
1,1-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methyl-propionoxy]-3,5-di(tert-butyl)phenylthio]ethane  
5 2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methyl-propionoxy]-3,5-di(tert-butyl)phenylthio]butane  
2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methyl-propionoxy]-3,5-di(tert-butyl)phenylthio]hexane  
2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methyl-propionoxy]-3,5-di(tert-amyl)phenylthio]propane  
10 2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methyl-propionoxy]-3-methyl-5-(tert-butyl)phenylthio]-propane  
2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methyl-propionoxy]-3-isopropyl-5-(tert-butyl)phenylthio]-propane  
15 1,1-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methyl-propionoxy]-3-isopropyl-5-(tert-butyl)phenylthio]-ethane  
2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-methyl-propionoxy]-3-isopropyl-5-(tert-butyl)phenylthio]-pentane.  
20
13. Industrial products in accordance with the first  
25 claim composed of the following compounds:  
2,2-Bis[4-[2-(5-benzofuryl)oxyacetoxy]-3,5-di-(tert-butyl)phenylthio]propane

- 2,2-Bis[4-[2-(5-benzofuryl)oxypropionoxy]-3,5-di-(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-(5-benzofuryl)oxy-2-methylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane
- 5 2,2-Bis[4-[2-(5-benzofuryl)oxy-2-ethylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-(5-benzofuryl)oxy-2-ethylbutyroxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-(5-benzofuryl)oxy-2-methylbutyroxy]-3,5-di(tert-butyl)phenylthio]propane
- 10 2,2-Bis[4-[2-(5-benzofuryl)oxybutyroxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-(5-benzofuryl)oxybutyroxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[4-(5-benzofuryl)oxybutyroxy]-3,5-di(tert-butyl)phenylthio]propane
- 15 2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-ethylpropionoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxy-2-ethylbutyroxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxyacetoxoy]-3,5-di(tert-butyl)phenylthio]propane
- 20 2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxypropionoxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxybutyroxy]-3,5-di(tert-butyl)phenylthio]propane
- 25 2,2-Bis[4-[4-(2-methyl-5-benzofuryl)oxybutyroxy]-3,5-di(tert-butyl)phenylthio]propane
- 2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxyvalerianoxy]-3,5-di(tert-butyl)phenylthio]propane

- 2,2-Bis[4-[3-(2-methyl-5-benzofuryl)oxypropion-  
oxy]-3,5-di(tert-butyl)phenylthio]propane  
2,2-Bis[4-[2-(2-methyl-5-benzofuryl)oxyacryloyl-  
oxy]-3,5-di(tert-butyl)phenylthio]propane  
5 2,2-Bis[4-[2-(2-ethyl-5-benzofuryl)oxy-2-methyl-  
propionoxy]-3,5-di(tert-butyl)phenylthio]propane  
2,2-Bis[4-[2-(2-isopropyl-5-benzofuryl)oxyacet-  
oxy]-3,5-di(tert-butyl)phenylthio]propane  
2,2-Bis[4-[2-(2-isopropyl-5-benzofuryl)oxy-2-  
10 methylpropionoxy]-3,5-di(tert-butyl)phenylthio]-  
propane.
14. Industrial product in accordance with the first  
claim composed of 2,2-bis(4-nicotinoyloxy-3,5-  
15 di(tert-butyl)phenylthio)propane.
15. Industrial products in accordance with the first  
claim composed of the following compounds:  
1,1-Bis(4-nicotinoyloxy-3,5-di(tert-butyl)phenyl-  
20 thio)propane  
1,1-Bis(4-nicotinoyloxy-3,5-di(tert-butyl)phenyl-  
thio)ethane  
2,2-Bis(4-nicotinoyloxy-3,5-di(tert-butyl)phenyl-  
thio)butane  
25 2,2-Bis(4-nicotinoyloxy-3,5-di(tert-butyl)phenyl-  
thio)hexane  
2,2-Bis(4-nicotinoyloxy-3,5-di(tert-amyl)phenyl-  
thio)propane

2,2-Bis(4-nicotinoyloxy-3-methyl-5-(tert-butyl)-  
phenylthio)propane

2,2-Bis(4-nicotinoyloxy-3-isopropyl-5-(tert-  
butyl)phenylthio)propane

5        1,1-Bis(4-nicotinoyloxy-3-isopropyl-5-(tert-  
butyl)phenylthio)ethane

2,2-Bis(4-nicotinoyloxy-3-isopropyl-5-(tert-  
butyl)phenylthio)pentane.

10    16.    Industrial products in accordance with the first  
claim composed of the following compounds:

2,2-Bis(4-(N-oxynicotinoyloxy)-3,5-di(tert-butyl)-  
phenylthio)propane

15        1,1-Bis(4-(N-oxynicotinoyloxy)-3,5-di(tert-butyl)-  
phenylthio)propane

1,1-Bis(4-(N-oxynicotinoyloxy)-3,5-di(tert-butyl)-  
phenylthio)ethane

2,2-Bis(4-(N-oxynicotinoyloxy)-3,5-di(tert-butyl)-  
phenylthio)butane

20        2,2-Bis(4-(N-oxynicotinoyloxy)-3,5-di(tert-butyl)-  
phenylthio)hexane

2,2-Bis(4-(N-oxynicotinoyloxy)-3,5-di(tert-amyl)-  
phenylthio)propane

25        2,2-Bis(4-(N-oxynicotinoyloxy)-3-methyl-5-(tert-  
butyl)phenylthio)propane

2,2-Bis(4-(N-oxynicotinoyloxy)-3-isopropyl-5-  
(tert-butyl)phenylthio)propane

1,1-Bis(4-(N-oxynicotinoyloxy)-3-isopropyl-5-(tert-butyl)phenylthio)ethane  
2,2-Bis(4-(N-oxynicotinoyloxy)-3-isopropyl-5-(tert-butyl)phenylthio)pentane.

5

17. Industrial product in accordance with the first claim composed of 2,2-bis[4-(5-thiazolylcarbonyloxy)-3,5-di(tert-butyl)phenylthio]propane.

10 18. Industrial products in accordance with the first claim composed of the following compounds:

1,1-Bis[4-(5-thiazolylcarbonyloxy)-3,5-di(tert-butyl)phenylthio]propane

15 1,1-Bis[4-(5-thiazolylcarbonyloxy)-3,5-di(tert-butyl)phenylthio]ethane

2,2-Bis[4-(5-thiazolylcarbonyloxy)-3,5-di(tert-butyl)phenylthio]butane

2,2-Bis[4-(5-thiazolylcarbonyloxy)-3,5-di(tert-butyl)phenylthio]hexane

20 2,2-Bis[4-(5-thiazolylcarbonyloxy)-3,5-di(tert-amyl)phenylthio]propane

2,2-Bis[4-(5-thiazolylcarbonyloxy)-3-methyl-5-(tert-butyl)phenylthio]propane

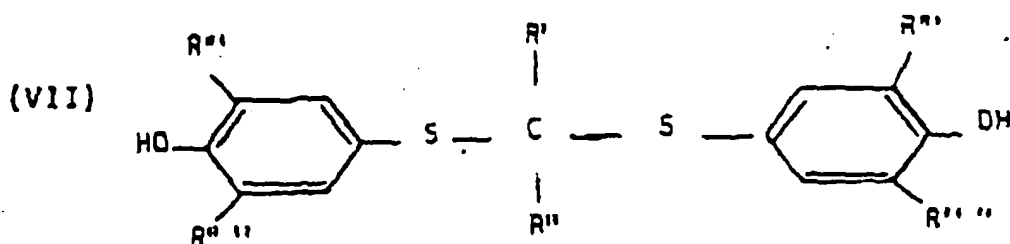
25 2,2-Bis[4-(5-thiazolylcarbonyloxy)-3-isopropyl-5-(tert-butyl)phenylthio]propane

1,1-Bis[4-(5-thiazolylcarbonyloxy)-3-isopropyl-5-(tert-butyl)phenylthio]ethane



2,2-Bis[4-(5-thiazolylcarbonyloxy)-3-isopropyl-5-(tert-butyl)phenylthio]pentane.

19. Manufacturing process consisting of the action of  
 5 a halide or an anhydride derived from an acid of  
 general formula  $X-COOH$ ,  $X$  being as said in the  
 first claim, on a bis(4-hydroxyphenylthio)alkane  
 defined by the following general formula VII:



in which  $R'$ ,  $R''$ ,  $R'''$  and  $R''''$  are as said in the  
 first claim.

- 15 20. Process in accordance with Claim 19, characterized  
 by the presence, in the reaction medium, of an  
 inorganic base or of a tertiary amine or of a  
 tertiary nitrogenous heterocycle.
- 20 21. Process in accordance with Claim 19, characterized  
 by the use of an O-metallic derivative of the  
 bis(4-hydroxyphenylthio)alkane of formula VII.

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